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Student Articles

Ames Forestry Club

Student Articles

The Mountain Pine Beetle

by Joe Bornong

MY fellow pine trees: We are gathered here today to mark the passing of our comrade-in-limbs, Fred Lodgepole. Not all of you may have known Fred. He lived on the north edge of our forest, and being as attached to his birthplace as he was, he didn't get around much. But, upon his passing, he left me a message which I feel I must share with all of you. It seems that Fred's passing will mean more to us than the loss of an individual member of our community, more than a new hole in the canopy available to our offspring, more even than the return to the soil of a few borrowed nutrients. Indeed, his death stands out as a sentinel, warning us of the probability of more death to spread throughout the forest. You see, Fred was the victim of that most dreaded of all maladies to afflict our genus in this area, the mountain pine beetle, *Dendroctonus ponderosae* Hopk. (= *monticolae* Hopk.). In the twelve months between the time Fred felt the first beetle successfully camp out in his cambium and the day he cashed in his chips at Hoerner-Waldorf Paper Co., he kept a notebook of observations of his attackers and requested that I relay this information to all of you so that we may become familiar with the appearance and behavior of our nemesis, the symptoms we may expect to encounter if attacked, and some things we may be able to do to avoid the ravages of an epidemic."

The Notes of Fred Lodgepole

I opened my stomates to the twelfth day of July as I did to any other day, stretched my parenchyma a little, and then stood still. Until a little after noon, not much happened. Then, I felt a prick in my bark. I knew that this was no lost Vermonter mistaking me for a suger maple when I felt the mandibles of an insect cut through my inner bark and into my sapwood and then commence to chew a gallery up my grain. I guessed immediately that this 4 to 7.5 mm long, stout, black, cylindrical beetle was the very same mountain pine beetle whose infamy was well-known thoughout much of the western United States and Canada (Furniss and Carolin, 1977). At first, I remained calm, but no matter how hard I tried to pitch the little devil out, it continued its upward course. Soon afterwards, I detected the entrance of another beetle into the same hole. from the display that followed, I surmised that one was female and one was male, but I refuse to repeat the disgusting details here. Over the next three days, the femle plunged into the construction of the gallery. I also detected some internal changes, as the muscles she had developed for flight degenerated in favor of increased reproductive system development (Reid, Sept. 1958). On the fourth day, elongation of the gallery was accompanied by boring of egg niches off either side of the gallery. Eggs were laid in about equal numbers on alternating sides of the gallery (Reid, Sept. 1958). Forty-five larvae emerged a few days later in this gallery. In other galleries which I was later to host, forty to sixty eggs were produced by a single mating, but no definitive limits could be set (Reid, Sept. 1958). Since the same female is capable of laying two or three broods in a season depending on length of the summer season, there is potential for very rapid expansion of a population (Reid, Sept. 1958).

The larvae had white to greyish bodies with brown sclerotized heads, and they soon started to carve feeding tunnels at right angles to the main gallery. Winter approached with the larvae preparing to overwinter in the last of their four instars. I hear that in that respect, I have an average brood, although some of my southern California relatives report that development of two full generations and a partial third would occur in one season there, while summers farther north are short enough to necessitate two years of development to complete a single generation (Furniss nad Carolin, 1977). By the first snow, I had many galleries filled with larvae, and some of my neighbors began to comment on how yellow my leaves looked. I tried to reassure them by saying that I was just tired.

When spring arrived, however, I knew that the end was near, as my several symptoms were very far advanced. Even I was shocked to look at my reflection in a nearby lake. Pitch tubes dotted my flank from near the ground up to my middle branches, and red boring dust stuck in my bark crevices and lay piled around my roots (Furniss and Carolin, 1977). My leaves, even the few new ones, were red. Internally, my sapwood, which a year before had functioned at a moisture content of about five times that of my heartwood, had dried to the same level or below that of the heartwood (Reid, 1961). I also noticed for the first time that the blue stain fungus *Ceratocystis montia,* whose spores had entered with the original beetle attack the previous July and which would leave again with the new brood to follow the beetle wherever they go, had deeply penetrated my sapwood (Carey and Wilcox).

As I counted my last days, my only hope was that I could benefit my fellow pine trees with what information I could collect concerning the beetles. In July, after several weeks of warm, dry weather, I felt the emergence of hundreds of black adults, borne by the wind to attack my neighbors. I wanted to spread something good as well. I had a wealth of other tree's experiences on which to draw; the beetle is epidemic on at least one of its principle hosts almost every year (Furniss and Carolin, 1977); plus I had my first-hand observations of individual insects. There are several factors which can make a stand particularly susceptible to major destruction, and

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The Memoirs of *Juglans Nigra*

by William E. Cambridge

HARD times?! You think you have hard times now? Why, back in the 30's, those were the hard times. I remember it like it was yesterday. I was just a young tree at the time, but it's something I'll never forget. It was the fall of 1935, about October I'd say, when IT hit. The dreaded Walnut Caterpillar!, *Datana integerrina.*

I'd heard rumors about this demon, but they were so few and far between that I thought nothing of them. I first noticed it early one morning, (I was "up with the sun" in those days), down on one of my lower branches I saw all of these first instar larvae. There must have been at least 300 of them. They were green with black heads and thoracic shields. The body hairs were there but were very inconspicuous. They were all feeding together in one large mass, but they were only feeding on the upper layer of cells from the top of the leaves.

In about 3 days these first instar molted, leaving their skins webbed enmass onto the brown, dead leaf they started on. When all the larvae had molted the second instar larvae moved onto my next leaf and started eating the whole leaf, leaving only the midrib and petiole. They molted again in four days. They fed for another four days, then moved down on the branch onto my trunk and molted into the fourth instar. During this time I had a chance to look over myself to find that the first three instars had destroyed almost 2.5% of my leaves on that branch, which didn't worry me too much, but when the fourth instar larvae emerged they moved up my trunk to a higher branch to feed. They fed for four days, each larvae eating 1½ leaves, destroying an addiitonal 11% of my leaves.

They finally moved down onto my trunk, but when they emerged I really got scared, they spread out all over me, about 1 per leaf, and they were getting big too. They were about 2 inches long and had a black body with longitudinal yellow stripes along their sides, and they were entirely covered with long, white hairs. It kind of tickled when they crawled, but it was really starting to hurt when they ate, which they did most of the time. By the end of four days they had almost entirely defoliated me. I was lucky that it was late in the season, but I still lost some growth. I was very happy when they all crawled down my trunk and scattered in all directions, going into the ground to pupate at a depth of from one to three inches.

I was pretty scrappy in my day so when spring rolled around I put on a lot of vigorous, new growth. It was quite a beautiful spring until this pesky moth started to fly around me in late May. It was a light reddish-brown. The front wings were darker than the second pair and had five dark brown traverse lines, and a spread of about 2 inches.

It went away in few days and I didn't think anymore of it. Then one night, this crazy coonhunter came around, you now the type that wears a cap that says, "Coon hunters do it all night." Well, anyway his stupid dogs were barking at some nonexistant coon that they thought had climbed up me. When the hunter got there and shined his lantern up into my crown there was of course no coon, but I did see something that startled me. There was a cluster of at least 800 eggs under a leaf on a branch about 10 feet up. The eggs were pale- green to blue-gray and their white caps shone in the lantern light.

Well, where did these come from? I asked myself. Then it hit me, they must have been layed by that moth. I wondered what type of eggs they were and in about a week I found out. They were those damned walnut caterpillars. They went through their entire generation again. Since I had grown quite a bit they did not kill me, but they sure did stunt my wood ring growth. I was lucky that I wasn't producing a large crop of nuts. I was starting to worry about being attacked by the flat-headed borer, but their population was low in my area that year so I guess I lucked out.

They were gone by July. I had lost a lot of leaves, but I grew more back in July, August, and September. They hit again in September and I thought I was a goner but I pulled through it okay and prayed that they wouldn't come back again in the spring.

Well it didn't work. Come May there was that pesky moth again, I was getting good at recognizing it by now. I really tryed putting on some growth now, preparing for the worst, but after 7 days the larvae never appeared. I took a closer look at the eggs and saw that they were all riddled with parasites. They weren't going to hatch. From the rumor I heard all the eggs in the area were infested with *Telenous ichthyurae*. I was saved! I went on that year to produce my biggest nut crop ever.

Today walnuts are more intensively managed in this area so my manager and his associates have developed several methods for controlling walnut caterpillar. For small trees in small plantations, the best control is to remove the egg clusters and colonies of larvae by clipping off and destroying infested twigs. I wouldn't really like it to be done to me but it is better in the long run and it's definitely better than torching the larvae while they are till crawling on me. The infested area should be clipped early because of the way the fifth instar larvae spread out, making control more difficult.

For large trees like me and large plantations, where it is impractical to remove eggs and larvae, chemical control may be necessary. Insecticides should be sprayed on larvae as soon as they appear. Malathion, Sevin, and Guthion are registered for use on me. But I only allow it if you read the label carefully for dilution rates and methods of application. I hope that my manager can develop a way to introduce that parasite to all of us walnuts as a natural control. I owe my longevity to it. Just last year my manager took an increment from me at about 1 foot off of the ground. I heard him say that I was nearly 70 years old. Then I heard him mention something about veneer, what ever that is. Say, what's that loud buzzing noise? ■

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Forester's Philosophical Itineracy of a Mountain Pine Beetle

by Skip Sivertsen

MY fellow Dendroctonuns, I stand here on this forest edge today to open your eyes to the moral decay which is rotting the foundations of our population. You are in the midst of an ethical deterioration which is a disgrace to your descendants! Where is your honor? Where are the traditions laid down thousands of years ago by your forefathers?! Are you not of the lineage of *ponderosae*? Have we not been blessed as the old canticles promised? Remember the excerpts when they spoke long ago. . . .

. . . "I will bring you out of the trees of resin, and I will bring you to a land flowing with phloem and cambium. . . .

But lo, in these days, some are breaking the customs of our ancestors, feeding on the upper bole where the size and density of the resin ducts increase. Some have chosen to attack young trees, where the resin flows heavy even at the root collar! Their punishment will come and their foolishness rewarded; for the day is near when they will be excluded. Adults and eggs alike will be surrounded by resin, and they will gnash their mandibles and weep as they perish.

Some endemic groups have decided to place their galleries in more resistant trees. I say woe to them, for they will be crushed by strong exudation pressures and poisoned by strong chemical components. They are doomed through their blindness, for they ignore the prsence of the resin impregnating the gallery walls.

Be patient. Wait for epidemic populations to come about. Why must we stray from what we know to be true? Do as our forefathers discovered; when the resistant tree is finally attacked, concentrate, and intensly hit one specific area.

Do not be deceived by those claiming to know of the deeper truths at higher elevations. Has not the cooler temperatures caused many of the generations to require two years to complete the cycle? Many of your friends have died in that time. And at these heights have not the late establishment of eggs caused even more mortality? May I be tosssed into a sea of DDT with a resin stone around my thorax if I haven't spoke the truth!!

Many are mourning over the lossed eggs, and I wail with you. But some cry out of injustice! I will shed tears but is it just to judge our maker? For who is greater than he? Remember the words spoke in the passages:

—in the beginning, the creator made an egg. And from this egg, a white larva emerged within a few days, and excavated feeding tunnels at right angles to the egg gallery. Time passed, and the larva constructed a pupal cell. It was in this cell that the larva could survive, knowing that the other stages would not survive. The larva pupated and the adult emerged in the spring, taking advantage of cracks and holes in the bark to come forth. The adult was rather stout and cylindrical, 4 to 7.5 mm long and black in color. Then the adult became lonely. But the creator saw the sadness and provided a mate. By July and into August, the beetles began excavating a gallery along the grain of the wood. Perpendicular galleries between 30-90 mm were constructed through the inner living bark, engraving both the bark and the wood. A crook was formed at the bottom of the gallery 25-50 mm in length. The eggs were deposited in niches, singly on alternate sides. An thus a new generation was formed and the creator sent them forth to the lodgepole; the western white; the ponderosa; the white bark; the sugar; and many other pines; and it was good.—

So, did you give life? Were you not created in the same way? Accept what has happened, for no injustice has occured.

Do you still have any doubts of our forefathers righteousnous? Do not the pitch tubes and red boring dust throughout the forests display our prosperity? Do you need to attack more than the lower meter of the trunk and up into the middle branches?! We are in a time where we should be rejoicing! The humans have vanquished the raging fires which once limited our numbers, and even have provided National Parks for our feasting pleasures. When have you seen prime stands of 60 year old and older mature and ripen as today has allowed?! Can you not sense the wood volatiles of those large diameter trees at this very moment? Never has there been so much slash sweetening the air! We even have our past brood logs to raise our own young. Is this not prosperity?

In this joy, I ask you to be grateful to our companion the fungus. For we are mutual allies of inseperable nature. As long as any one can remember, they have stressed our hosts by clogging the conductive tissues. Spreading their lovely blue strains may take place after only 40 days. They may even go as far as to girdle the tree and ask only to travel from place to place as our friends. Truely we are blessed. As our ancestors once said;

—early to vector, blue stain rely, makes the host orange by mid-July—

—Happy is the beetle who feeds on the stressed, injured and down; for rich phloem will be harvest—

—Successful is the beetle who vectors the fungus, for the forest shall he inherit—

I believe you are strong, but I must convey this warning: Beware of the humans, for they are predators. Be like eggs to evil, but be mature in the ways of the pine. They have led many of our beetles away, sending them lusting after false pheromones, and consuming their bodies in the flames. Be strong, and do not let your desires of hunger and lust befall you!

Haven't the humans always tried to eradicate our race?! Do not be fooled!! When humans are around, "a beetle and his slash may soon be parted". They have often burned or sprayed toxic chemicals on both fallen and standing trees. I have even seen the monsters harvest trees before the brood emerges! So I say be careful, for even though their methods have had minor effects on our attacks, they wish to see each one of us suffer.

Humans are not your only foe. Beware of birds bearing pointy beaks, for the woodpecker will consume you. There are many insects which are jealous of your prosperity. So do not be tricked by their deeds; the red-bellied clerid and the bark beetle predator (*Coeloides brunneri*) are two specific examples to be wary of. Also, do not let the wood borers into you home, for they plan to steal your food and space. Several bacteria, fungi, and virus also compete with your life style, so be cautious.

I will try and visit you once again, but I am old. Remember the traditions of our ancestors. Change when you are stressed but keep the passages of old in mind. Our generations are rapid, and often large, so we will

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Unsuccessful Ornamental White Birch

by David L. Cox

AS the chain saw rips from me the last moments of life remaining, of which the foreign causal agent has not taken, my life flashes before my eyes. Life started as a seedling raised in a nursery in nothern Minnesota. After several years, I grew to the height of 3 feet tall at which time my roots were pruned to encourage thicker, shorter, root growth. The following year the nurseryman carefully dug me up, removed excess soil from my roots, and fit me into a crate along with the other white birches of the same age and size. After many hours of riding in a truck that apparently lacked shock absorbers, the top of the crate was opened and we were finally able to see light.

The long ride made me very thirsty and tired so a man that had unloaded us placed my roots in a container of water (sigh!). As my roots were refreshed, I watched the man set other birches into pots, filling the pots with fresh soil. Finally, I was next in line. He measured to see if my roots would fit into the pot he had selected. I had really grown and developed good roots the year before so my roots were too long and plentiful to fit into this pot. The man reached into the back pocket of his OshGosh overalls for pruners (my stomates froze with fear) and proceeded in cutting at least ⅓ of my roots to make them fit into the pot. Then he filled the pot with fresh soil, drenching it with water.

I was placed among other relatives of the same age and size. Looking about me, I could see a sign that read "Marshalltown Landscaping, Iowa's #1 Landscaping Nursery." I remained in this location where for the next two months, I experienced a great deal of stress. Little water was available to drink and the hot summer sun kept heating up my bark. I just couldn't produce enough foliage to effectively shade myself from the sun. The dark colored pot also absorbed the sun, warming up my roots to unbearable temperatures due to heat transfer.

One day someone came and picked *me* out from among the other birches and I was loaded in an upright position onto the back of his pick-up. By the time we reached the place where I am planted today, the wind had burned my leaves causing the stomates to close very tightly. I was unloaded, the plastic pot was removed, and he placed me into a hole that had been dug right next to the eaves spout that extends from the roof on the south side of the house. The man then mixed peat and soil together and flled in the area around my roots. I was fertilized and watered and very happy with my new home!

Summer came to an end and winter was fast approaching. The winter months seemed much less severe here than in Minnesota where I had grown up. Winter was also not as long either—it seemed like winter was here and gone and before I knew it springtime and the warmer winds came upon me.

One great sunny day my homeowner, George, was talking to an Iowa State Extension entomologist (I could tell by his jacket) on the patio which is next to me. I cranked open my stomates so I could leaves-drop on their conversation. The entomologist said that I was at a "home away from home" where I wouldn't grow as well as I would have in northern Minnesota from a seedling. He went on to explain that because this was not my native home, I would be more susceptable to stress, and insect attacks. The bronze birch borer was the main insect that would attack and as I grew older, stress would become a serious problem. Unless carefully controlled, the bronze birch borer, *Agrilus anxius* Gory, would kill me. My homeowner then asked the extension entomologist what were the best preventive measures. The entomologist explained these to him and the last thing I heard was my homeowner saying, while shaking the entomologist's hand, "I will do all those things you have mentioned to prevent attack on this beautiful birch tree of mine." I sighed with relief thinking that I was in "good hands."

The spring rains came and gave me a good chance to establish my root system. Early in the spring, George fertilized me which provided me with a good supply of nutrients to grow new branches and leaves. But as it rained, I was unable to absorb oxygen because of the excess water that drained from the eaves spout. This water drained off the roof, down the eaves spout, and right onto the ground above my roots where it sat there until it either soaked into the soil, or ran onto the patio. This upset my metabolic system causing me to become ill (stress) because the oxygen I critically needed to take up in my roots was limited. I eventually grew out of my illness as the days wore on and the rains ceased to come as often.

When summer came I had grown rapidly, attaining a height that was a few feet higher than the house. This allowed me to see everywhere around the area. One day I was surveying the neighbors yard and about 50 yards away was a tall and beautiful white birch tree just like me except a lot older. As I focused for a closer look (she was quite attractive) I could see that some of the limbs in the upper crown of the tree were dead. My curiosity arose (even more) of what could be causing the dieback, and if that could eventually happen to me. All I could do, I guess, is wait and see.

Impatiently I awaited fall, looking forward to the cooler period instead of the hot summer, and because the pests that liked sitting and feeding on my leaves and/or bark would be nearly non-existant. Fall finally did arrive, and I began producing abscisic acid which caused my leaves to fall and prepared my system for the winter months that lay ahead.

Several cycles of seasons occurred and I grew steadily older. I noticed that the white birch next door was dying back more each year. I, too, seemed to become ill for longer periods of time now. Greenish-bronze colored beetles slightly less than 3/8" to 1/2" in length (really rather pretty little pests) were feeding on my leaves. My leaves were not affected detrimentally and I could still obtain energy from the sun. I just didn't like the thought of having an insect (no matter how pretty) crawling around and using my leaf as a urinal and/or area for fecal deposition.

It was approximately five years

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I am worried about this stand. The worst part is, some of the factors cannot be manipulated by you or by the foresters in the area. For one, we have had several mild winters in a row, and this has contributed to maximum brood survival (-----, 1981). Also, national economic conditions have hindered the Forest Service's main preventive technique, selling and cutting overstocked, mature stands like ours which are primary targets for beetle attack. A recent decline in the housing market has resulted in a lag in cutting (-----, 1981). Other direct controls are limited in effectiveness. Disposal of attacked trees, by felling and burning or peeling, have proved uneconomical (Furniss and Carolin, 1977). Oil-based chemical sprays have proven effective at killing beetles under bark, (Gibson) but cost and labor requirements reduce their desirability. Biological control agents include woodpeckers, several predacious and parasitic insects (Furniss and Carolin, 1977), and at least seven species of nematodes (-----, 1958). These, too, are limited in effectiveness. Predator and parasite population build-ups lag behind beetle increases, so considerable damage may be done before full force of beetle killers is exerted. Also, once an epidemic gets rolling, "a bird can eat only so many beetles and there are billions of them," according to Ken Gibson, a Forest Service entomologist (-----, 1981). considering that thinning of younger stands and sale of older prime stands may be hindered by a lack of funds and a lack of buyers, if I wasn't dead, I'd be worried. With this, I leave this earth knowing that some of my neighbors will soon follow me to the great wilderness in the sky, where there are no chainsaws or campers with washlines to hang, but consoled with the hope that this report may benefit most of you and contribute to management of the mountain pine beetle.

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prosper over our hosts and hopefully over our competetors. ■

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Unsuccessful Birch
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after being planted in George's yard, that I became deathly ill for nearly the entire spring and summer. Many factors led up to my extended stress condition. It rained excessively that spring which made the soil around my roots saturated continuously with water. Therefore, I wasn't allowed to get a good start of nutritional sap flowing through my phloem resulting in a stress condition and little growth production. As a result of the excess rainfall, soil had washed from under the drip line of my crown and collected on the patio. A little gully was created so George decided to fill it in with soil. He over-estimated (of course) the amount of soil he needed so he spread the rest on the ground under my crown to divert the water that might drain from the eaves spout. The amount of excess soil was about four inches on top of the original ground line. This my surface feeder roots disliked drastically! It also resulted in additional stress on me.

When summer came I was beginning to feel a little better. I noticed that the neighbor's birch tree limbs (she doesn't mind my notices) had died back even further. Now only half of the crown was living and the other half looked almost dead.

One bright and sunny day in June (around mid-summer) George decided to trim back my branches that had grown out over the house and the low ones that the kids were climbing on. He did a quick, neat job and with very little pain being inflicted upon me. Unfortunately, he forgot to apply a pruning seal to my open wounds so I had to try and close these wounds by exuding excessive sap. About a day later, I noticed that insects were being attracted to the sap and some of them were those greenish-bronze beetles that had previously eaten on my leaves a few years ago. As the month of June progressed, more and more of these beetles were feeding my leaves.

One day I heard a chain saw and not to my surprise the neighbors were cutting down their white birch that was either dead or nearly so. Because I am so closely related to the weeping birch, I wept for awhile to pay my tributes to one of my own kin. By this time (July), most of the birch beetles were moving about on my leaves and bark as if it was the noon rush hour in a big city. The female birch beetles' location depended on their situation. The females in the leaves (being less conspicuous) were looking for a sensual partner that would "love 'em and leave 'em alone." Some were even walking the midrib (midway) to draw attention to themselves. Those females that had mated were looking for wounds and crevices in the bark in which to lay their eggs. Besides the wounds caused by pruning, there were wounds from the riding lawn mower banging into me and from the kids carving their names in my trunk.

After almost a week, most of the beetles were gone. Then another week later, a queer feeling occurred all over my bark (branches, twigs, trunk) as if someone was doing acupuncture on me with dull needles.

With the excessive heat from the sun and the attack of the larvae of the bronze birch borer adult, my respiration increased, and the sap in the phloem increased in the volume of flow.

My respiration remained high for several days and the phloem was flowing excessively, trying to drown the larvae. The drowning worked, killing most of the larvae and ceasing the painfull puncturing caused by the larvae. A select few must have survived the drowning because I could feel something chewing and moving between the bark and wood, leaving remnants of deposition in its gallery. It felt as if something was crawling on your skin just beneath your clothing, biting and chewing along the way.

Because of the pain and stress, I was in from early spring through summer, the fall seemed slow in coming. The larvae were preparing to over winter in a boat-shaped depression carved into my phloem. As they dug deeper into the phloem, I wished that, in the boat they made, I could set them a-'sailing just to remove them from me.

As winter progressed, the larvae's damage from winding back and forth forming feeding galleries in the phloem caused a slight girdling effect. It is difficult enough just to get sap to my outer twigs and branches in the winter time without any birch boring, side-winding, sap-stopping, flatheaded son of a birch larvae contributing to the difficulties! Their presence in and destruction of the phloem tubes reduced the efficiency and the amount of sap I could get to the upper crown of twigs and branches. I had a numb feeling in the outer crown twigs and branches. My terminal buds would not be viable for next spring's growth.

Spring came as usual following winter. Rains were fewer and my roots didn't have any problem getting sufficient oxygen from the soil as was the case in previous springs. My leaves were starting to unfold from the buds on limbs that hadn't died over the winter. Most of the dead twigs and branches were in the upper ⅓ of the crown. I started new phloem tubes over the top of the larvae galleries damage. This resulted in ridges, similar to a double chin. I had a good start in recovering from last year's stress.

In late spring (around the last part of April or early May), I sensed a little movement in the boat-shaped depression made by the larvae last fall. Quite soon after I felt this movement, it stopped. The "larvae" must have gone into pupation.

One day, the neighbor came over and was discussing the loss of his white birch tree (sigh). Because they were sitting in their lawn chairs, slurping their tea, directly under me, I leaves-dropped on their conversation. The neighbor (his name was Ralph) was explaining how his tree had died. He suggested that the reason for part of the crown dieback in me was due to the bronze birch borer (I'm sure you know some people like Ralph who don't play with a full deck, although this time he was right about the bronze birch borer causing dieback in my crown). Ralph proceeded in saying that chemical control at this stage of dieback is the only hope to kill the bronze birch borer. George asked Ralph, "What did you do with the birch you cut down?" Ralph said that he was using it for firewood and had it stacked in his backyard. I thought to myself, "What optimal conditions and a perfect spot for the adults to emerge from and descend on me in hoards." George replied, "I think I will cut out some of the dead branches and stick it right here along the house because it makes such a decorative firewood." Well, that was all I could take from those two. Now I know that both George and Ralph are sitting on what little brains they do have.

During the first week in June, George came out and sprayed Cygon on me to kill the emerging adults that were leaving a D-shaped hole in my bark. He sprayed again two weeks later and his effort again killed the emerging adults. But the biggest problem he overlooked was not spraying the birch firewood he had cut from my crown and/or the firewood belonging to Ralph. The adults had emerged from the firewood late thus escaping the earlier sprayings on the tree. About the third and fourth week of June the bronze birch borer adults were thicker than last year at this time.

I knew George was mentally disabled when he bought two house cats earlier in the spring. The cats, when let out of the house, would sharpen their claws on my bark (if only my bark could bark). This provided a perfect place for those egg laying adults of those birch boring, side-winding, sap-stopping, flatheaded son of a birches. The progression of attack was the same as last summer but more severe. Because of such stressful conditions last year and girdling that reduced the sap flow, my means of defense were gone (besides I am getting to be trunk). I became a parasitic host to the bronze birch borer and my existence as a tree was quickly closing in on me.

The winter killed most of my branches and by spring, all that remained was ⅓ of my crown. My bark was becoming yellow, a sign of dead tissue.

Just a few minutes ago, a pick-up drove into the driveway hauling a river birch tree. As my flash back dissipates, I am forced back into reality, faced wtih the inevitable sound of death rushing my lenticels (ears); the chain saw! ■

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